

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

PUBLICATION NUMBER : 03231701  
PUBLICATION DATE : 15-10-91

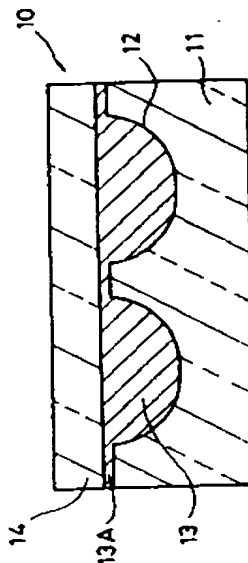
APPLICATION DATE : 07-02-90  
APPLICATION NUMBER : 02027713

APPLICANT : NIPPON SHEET GLASS CO LTD;

INVENTOR : WADA HIROSHI;

INT.CL. : G02B 3/00 G02B 1/04 G02B 6/12  
G03B 27/50

TITLE : FLAT PLATE LENS



**ABSTRACT :** **PURPOSE:** To eliminate the need for polishing after filling a transparent material into recessed parts which form curved surfaces on bottom walls and to obtain uniform lens performance by forming these recessed parts on one surface side of a transparent glass substrate, filling the transparent resin material having the refractive index different from the refractive index of the substrate into the recessed parts and joining another transparent glass substrate to the substrate surface opened with the recessed parts.

**CONSTITUTION:** The recessed parts 12 which form the curved surfaces on the bottom walls are formed on one surface side of the flat plate substrate 11 consisting of glass. The transparent resin material 13 having the refractive index larger than the refractive index of the substrate 11 is filled into the recessed parts 12. A resin layer 13A having some thickness is simultaneously applied and formed on the substrate surface and another transparent glass substrate 14 having a flat surface as a cover plate is joined to this surface. Since the transparent cover plate 14 is joined via the resin layer 13A stuck on the surface in this case, the flat surface of the cover plate 14 is utilizable as it is as a light incident/exist surface. The need for surface polishing is eliminated in this way. Since the resin packing thicknesses in the respective lens parts are uniformized by the pressing and joining of the cover plate 14, the lenses having the uniformized optical characteristics are obt'd.

**COPYRIGHT:** (C)1991,JPO&Japio